Warm up

Simplify

$$\frac{5 \pm \sqrt{24}}{2}$$

$$\frac{5 \pm 2\sqrt{6}}{2}$$

14.5 9.5

Solve Using the Quadratic formula

$3x^2 + 4x - 5 = 0$

$$x = \frac{-(4) \pm \sqrt{(4)^2 - 4(3)(-5)}}{2(3)}$$

$$x = \frac{-4 \pm 8.7}{6}$$

$$= \frac{-4+8.7}{6} = .78 \qquad \frac{-4-8.7}{6} = -2$$

Complex Operations

$$i = \sqrt{-1}$$

or

$$i^2 = -1$$

$$i^3 = -\sqrt{-1} = i^2 \cdot i = -1i$$

Identify the real and imaginary parts of each complex number.

3 $\mathbb{R}$

$7i$ $\mathbb{R}$ $\mathbb{C}$

$5 - 7i$ $\mathbb{R}$ $\mathbb{C}$

Write each of the following as a pure imaginary number.

$\sqrt{-16}$

$\sqrt{-1}\sqrt{16}$

$4i$

$\sqrt{-3}$

$\sqrt{-1}\sqrt{3}$

$\sqrt{3}\,i = i\sqrt{3}$

$\sqrt{-18}$

$9^{\frac{1}{2}}$

3^3

$= 3i\sqrt{2}$

$3\sqrt{2}i$

You Try

$\sqrt{-12}$

$2i\sqrt{3}$

$\sqrt{-5}$

$-\sqrt{5}\,i$ $\quad i\sqrt{5}$

$\sqrt{-1}\sqrt{36}$

6

$\sqrt{-36}$

$6i$

Square Root Property

$\sqrt{n^2} = \sqrt{36}$ $\quad n = 6, -6$ $\quad n = \pm 6$

$\sqrt{x^2} = \sqrt{24} = 2\sqrt{6}$ $\quad x = 2\sqrt{6}, -2\sqrt{6}$ $\quad x = \pm 2\sqrt{6}$

$\sqrt{k^2} = \sqrt{78}$ $\quad k = \pm 1\sqrt{78}$

18) $9x^2 - 7 = 722$

$+7 \quad +7$

$\frac{9x^2}{9} = \frac{729}{9}$

$\sqrt{x^2} = \sqrt{81}$

$x = 9, -9$